REMARKS

Claims 1-6 and 8-20 are pending in this application with claim 1 being amended and claim 7 being cancelled by this response. Claim 1 has been amended to include the features of original claim 7 and to clarify the characteristics of the present claimed invention. Support for the amendments to claim 1 can be found throughout the specification and more specifically in figure 2 and on page 12, lines 1-4 and 12-16.

Rejection of Claims 1, 3, 5, 6, 8-10 and 19-20 under 35 USC § 103(a)

Claims 1, 3, 5, 6, 8-10 and 19-20 are rejected under 35 U.S.C. 103(a) as being anticipated by Katata et al. (US Patent No. 6,088,061).

The present claimed invention provides a process for the blockwise coding of digital video images in which each block is assigned a specified resolution dependent on a zone in which this block is located. An image comprises at least two zones to which different resolutions are assigned. Each image is coded by transforming the blocks from the spatial domain to the frequency domain. Mixed blocks straddling two zones of different resolutions are detected and constructed by determining the zone corresponding to each pixel of these mixed blocks. By allocating the resolution of a specified zone to this pixel we get constructed mixed blocks which are transformed in the frequency domain. The image is coded via data or coefficients in the frequency domain. A resolution is allocated to each pixel of the mixed blocks based upon its zone. The data of the frequency domain are quantized and dequantized before being used for a retransformation into the spatial domain.

Katata et al. neither disclose nor suggest that "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present

invention. Additionally, Katata et al. neither disclose nor suggest that "the image is coded via data or coefficients in the frequency domain, and in that to allocate to each pixel of the mixed blocks the resolution which corresponds to its zone, the data of the frequency domain are quantized, dequantized before being used for a retransformation into the spatial domain" as recited in claim 1 of the present invention.

Katata et al. describe a video coding device which is capable of making coded data having a hierarchical structure wherein a specified area of each frame is selected. The position and shape of the selected area is encoded and a pixel value of the selected area is encoded as lower-layer coded data. A pixel value of a whole image is encoded as first upper-layer coded data by using pixel values of already decoded images of the lower-layer and the first upper layer. A pixel value of the selected area is encoded as second upper-layer coded data by using pixel values of already decoded images of the lower-layer and the second upper layer (See Abstract).

The present claimed invention describes the construction of blocks having different resolutions and the transformation of those blocks in the frequency domain. The transformation is applied to either a whole block having different resolutions or part of a block having different resolutions. Katata discloses the transformation of blocks of a first resolution and transformation of blocks of a second resolution, but not transformation of blocks with mixed resolutions.

Specifically, Katata et al. neither disclose nor suggest a process in which "mixed blocks straddling two zones of different resolutions are detected" and "transformed in the frequency domain" as recited in claim 1 of the present invention. Katata et al. describe that "the background image and part images may be independently encoded...considering the background image as a lower-layer and the part images as upper-layers...Each upper-layer image can be effectively encoded by predicting its pixel value from that of the lower-layer image" (Col. 17, lines 35-40). Thus, Katata et al. merely disclose encoding whole blocks of a single layer—either independently or dependently.

Furthermore, Katata et al. neither disclose nor suggest that "mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks" as recited in claim 1 of the present invention. Katata et al. describe the reconstruction of an image block by block and then the application of a weighting function (column 15, lines 31-34 and figure 20). The weighting function corresponds to the alpha plane and is executed after the blocks of a single resoltion have been transformed. In contrast, the present claimed invention reconstructs an image by reconstructing the single resolution blocks in a single resolution scheme and reconstructing mixed resolution blocks pixel by pixel to display both resolution schemes. Thus, the reconstruction of an image as described by Katata et al. is wholly different than the image reconstruction described by the present claimed invention as Katata et al. do not even suggest the construction of mixed resolution blocks.

The Office Action states that using DCT unit for transforming picture data/blocks from the spatial domain to a frequency domain and vice versa is well known in the art and is within the scope of MPEG block wise processing in the Katata reference. Furthermore, the Office Action asserts that it would have been obvious to one having ordinary skill in the art at the time of the invention was made to implement such teaching in an effort to transform blocks from spatial to frequency domain. Applicant respectfully disagrees. The MPEG standard only proposes the reconstruction of blocks and the transformation of blocks having the **same resolution**. In MPEG, the reconstructed image implements dequantification and inverse transformation of a block made up of coefficients undergoing the same quantization, i.e. having the same resolution. See, for example, ISO/IEC 13818-2:1996(E), paragraph 7.5 titled "Inverse DCT", which specifies that once the DCT coefficients F(u,v) are reconstructed, the inverse DCT transform defined in Annex A shall be applied to obtain the inverse transformed values f(y,x). All the DCT coefficients F(u,v) of a block are obtained through an inverse quantization (see paragraph 7.4 of the same document). This inverse quantization uses the same quantizer scale for all the coefficients

of the block. The block which undergoes the transformation is a block having the same resolution, as defined by the quantizer. Consequently, combining Katata with the MPEG standard doesn't render obviousness to the present claimed invention as asserted in the Office action. To the contrary, the MPEG process teaches reconstruction of blocks and the transformation of blocks having the same resolution rather than reconstructing "mixed blocks" of different resolutions wherein "said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present claimed invention.

The Examiner admits that Katata is "silent in regards to explicitly mention 'image being coded by using transformation of blocks from the spatial domain to the frequency domain'" as stated in claim 1 of the present invention. Thus, Katata neither discloses nor suggests that "the image is coded via data or coefficients in the frequency domain, and in that to allocate to each pixel of the mixed blocks the resolution which corresponds to its zone, the data of the frequency domain are quantized, dequantized before being used for a retransformation into the spatial domain" as recited in claim 1 of the present invention.

The present claimed invention is concerned with minimizing the block artefacts when blockwise processing pixels for the coding of images involving several resolutions (page 4, lines 26-29). Thus, the present claimed invention introduces a process comprising a step of calculating or constructing a mixed block having more than one resolution and a transformation of the mixed block. The transformation is not of blocks of the source image, but of reconstructed blocks of pixels having different resolutions. This transformation takes into account the different resolutions within the block. Using the method described above, the present claimed invention makes it possible to calculate data of an enhancement layer, by subtracting a reconstructed block (24) having a low resolution from this transformed mixed block (68), avoiding block artifacts for blocks laying on an area with different resolutions.

Katata et al. propose the use of weighting pixels in reference to the alpha-plane to reconstruct blocks. The source image is first split into blocks having a same resolution, the

blocks are coded and then the coefficients are weighted according to the alpha plane defining the high-resolution parts of the image. In essence, Katata et al. merely weight single resolution blocks. Thus, Katata et al. solve the problem of artifacts in a way fundamentally different from the present claimed invention, as the present claimed invention constructs mixed blocks pixel by pixel for transformation in the frequency domain and Katata et al. describe using a prepared alpha plane or gradation for weighting coefficients of single resolution blocks (see bottom of col. 14 and top of col. 15).

As claims 3, 5-6, 8-10, 19 and 20 are dependent on Independent claim 1 it is respectfully submitted that these claims are allowable for the same reasons discussed above regarding claim 1. In view of the above remarks it is respectfully submitted that claims 3, 5-6, 8-10, 19 and 20 are also allowable.

In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Katata et al. showing the above discussed features. It is thus further respectfully submitted that claims 1, 3, 5-6, 8-10, 19 and 20 are patentable over Katata et al. and that this rejection is satisfied and should be withdrawn.

Rejection of Claims 2, 11-17 under 35 USC § 103(a)

Claims 2, 11-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katata '061 in view of Li (US Patent Application No. 2002/0051488).

Katata et al. and Li, when taken alone or in combination, neither disclose nor suggest a process in which "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention.

Li describes a generic spatially-scalable shape encoding apparatus for handling different mask decomposition methods. The generic spatially-scalable shape encoding apparatus applies three encoding steps to maximize the coding efficiency of the encoder. The three steps include mask mode encoding, base mask layer coding and enhancement mask layer encoding (see Abstract).

The Office Action references page 1, section 0011 of Li as teaching a "mixed block comprising two adjacent zones, one having a first resolution and the other a second resolution greater than the first" (page 5). However, Li, similarly to Katata et al., neither discloses nor suggests a process in which "mixed blocks straddling two zones of different resolutions are detected" and "transformed in the frequency domain" as recited in claim 1 of the present invention. Section 0011 of Li describes that mask layers that are above the base layer are hierarchically and/or contextually encoded using information from an immediate lower mask layer. Namely, **each layer** or "enhancement mask layer" is encoded using information that is derived from a mask layer that is immediately below the present mask layer of interest. Li merely discloses encoding a single layer based upon information derived from a mask layer below it and NOT mixed blocks straddling two zones of different resolutions as disclosed in the present claimed invention. Thus, Li, similarly to Katata et al., neither discloses nor suggests "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present claimed invention.

The Office Action asserts that it would have been obvious to one having ordinary skill in the art at the time the invention was made "to specifically use MPEG 4 in Katata video coding for the purpose of shape and texture coding of video images as taught by Li" (page 5). Applicant respectfully disagrees. Katata does not teach MPEG4

coding as claimed, but rather MPEG-1, an entirely different coding standard. There is no motivation to combine these two references as Li utilizes MPEG4 coding rather than MPEG-1 coding as described in Katata, which does not utilize colors, textures, brightness, and/or motion of the pixel for image segmentation. Additionally, Li, similarly to Katata et al., is not concerned with mixed blocks containing pixels belonging to a first zone and pixels belonging to a second zone as in the present claimed invention. Furthermore, Li is not concerned with detecting mixed blocks, constructing mixed blocks by assigning a resolution to each of its pixels or transforming the mixed blcoks in the frequency domain.

The Office Action further asserts that the combination of the systems of Katata et al. and Li disclose the principles of the present claimed invention. However, the combined system, similarly to the individual systems of Katata et al. and Li, would neither disclose nor suggest a process wherein "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention. The combined system, similarly to the individual systems of Katata et al. and Li, also would not be concerned with detecting mixed blocks containing pixels belonging to a first zone and pixels belonging to a second zone, constructing the mixed blocks by assigning a resolution to each of its pixels or transforming the mixed blocks in the frequency domain as in the present claimed invention.

As claims 2 and 11-17 are dependent on Independent claim 1 it is respectfully submitted that they are allowable for the same reasons as discussed above in respect to claim 1. In view of the above remarks it is respectfully submitted that claims 2 and 11-17 are also allowable.

In view of the above remarks and amendments to the claims it is respectfully

submitted that there is no 35 USC 112 compliant enabling disclosure in Katata et al. and Li, when taken alone or in combination, showing the above discussed features. It is thus further respectfully submitted that claims 2 and 11-17 are patentable over Katata et al. and Li, when taken alone or in combination, and that this rejection is satisfied and should be withdrawn.

Rejection of Claim 4 under 35 USC § 103(a)

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Katata et al. in view of Jiang (US Patent Application No. 2002/0118743).

Katata et al. and Jiang, when taken alone or in combination, neither disclose nor suggest a process in which "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention.

Jiang describes a post-clipping method in the coding system for fine granularity scalability (FGS) video coding. The FGS enhancement layer encoding and decoding operations can be mapped to simple motion compensation operations. The Office Action asserts that Jiang discloses the principles of the present claimed invention. However, Jiang, similarly to Katata et al., neither discloses nor suggests a process in which "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention. Jiang, similarly to Katata et al. and Li, is not concerned with mixed blocks containing pixels belonging to a first zone and pixels

belonging to a second zone as in the present claimed invention. Accordingly, Jiang is not concerned with detecting mixed blocks, constructing mixed blocks by assigning a resolution to each of its pixels or transforming the mixed blocks in the frequency domain.

The Office Action asserts that the combination of the systems of Katata et al. and Jiang discloses the principles of the present claimed invention. However, the combined system, similarly to the individual systems of Katata et al. and Jiang, would not be concerned with the detection of mixed blocks, the allocation of the resolution of each pixel according to its corresponding zone and the transformation of the mixed blocks in the frequency domain as in the present claimed invention. Therefore, the combined system, similarly to the individual systems of Katata et al. and Jiang, would neither disclose nor suggest a process wherein "mixed blocks straddling two zones of different resolutions are detected, said mixed blocks are constructed by determining the zone corresponding to each pixel of these mixed blocks by allocating the resolution of this specified zone to this pixel to get constructed mixed blocks and said constructed mixed blocks are transformed in the frequency domain" as recited in claim 1 of the present invention.

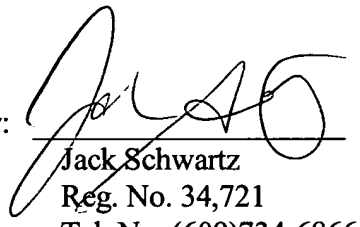
As claim 4 is dependent on Independent claim 1 it is respectfully submitted that they are allowable for the same reasons as discussed above in respect to claim 1. In view of the above remarks it is respectfully submitted that claim 4 is also allowable.

In view of the above remarks and amendments to the claims it is respectfully submitted that there is no 35 USC 112 compliant enabling disclosure in Katata et al. and Jiang, when taken alone or in combination, showing the above discussed features. It is thus further respectfully submitted that claim 4 is patentable over Katata et al. and Jiang, when taken alone or in combination, and that this rejection is satisfied and should be withdrawn.

Having fully addressed the Examiner's rejections, it is believed that, in view of the preceding amendments and remarks, this application stands in condition for allowance. Accordingly then, reconsideration and allowance are respectfully solicited. If, however, the Examiner is of the opinion that such action cannot be taken, the Examiner is invited to contact the applicant's attorney at the phone number below, so that a mutually convenient date and time for a telephonic interview may be scheduled.

No fee is believed due. However, if a fee is due, please charge the fee to Deposit Account 07-0832.

Respectfully submitted,
Anita Orhand et al.

By: 

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